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# THE RENEWAL OF LIFE.

Rizpah the daughter of Aiah watched for six months, from "the beginning of barley-harvest" in April, to the rainy season in October, to guard her kinsmen's corpses from the beasts of prey. So long under the sky of Palestine did they continue an attraction to the wild dogs and birds. In a moister air decay is quicker, but still not so quick as is often supposed. The observations of M. Devergie* on the bodies at the Morgue, show that, two months and a half after decease, the muscular structures still preserve their natural form and colour. Up to three months and a half, the scalp, eyelids, and nose so far retain their ordinary appearance that the age of the individual may be told. It is four months and a half before complete destruction of the face occurs, or the bones become brittle, and the bulky muscles of the neck and thighs are converted into adipocere. So that we may reckon three months and a half as a short period to be occupied by the decomposition of the form of a human body. So long does flesh remain flesh, and tissue tissue, and is not resolved into its mother earth.

Let us escape quickly from these shuddering scenes of the charnel-house to the joyous bustle of brimming life. How long does it take a living body to decay? "A *living* body decay?" Yes, in truth; but whereas, in the former case, decay was a thing to make men shiver, the fading of a long-loved image, the tearing up of a fair garment, the ruin of a darling home, the violation of a worshipped shrine, the forcible divorce from our nearest and dearest—it is all this and more; in the latter it is associated with the fullest fruition of all that is joyous in existence—the bounding pulse, the free-drawn breath, the swelling chest, the thrilling sense of health, the highest uses of mind and body. Decay, in fact, is more truly a part of life than it is of death; for it continues unstayed through the whole of corporeal existence; whereas, after dissolution, it gradually ceases, and ends its work with the conversion of the organic particles into unaltering eternal elements. The most truly living body is the most active in decay; the more bodily and mental vigour are displayed, the more quickly do the various tissues melt down into substances which are without delay removed by the excreting organs. The more the navvy works his arms and the statesman his brain, the heavier bulk of carbon, nitrogen, oxygen, and hydrogen is thrown out by lungs, liver, skin, kidneys, &c. Does he, then, wear them out by this constant friction and drain? No, no; the more the bricks are removed from the old wall, the more new bricks will a good builder put in; and so, provided that the supply is sufficient—that the builder *is* a good one—the more rapid the drain, the newer and stronger and better will the body become.

Let us try and reckon how long it takes, by living decay, for the living body to be drained away, and to have its substance renewed. In the ghastly details recounted at the commencement of this paper, the nitrogenous fleshy parts were most accounted of as giving form and the general appearance of a man to the poor dissolving corpse. So of the nitrogenous parts we will now speak: how long are they being removed by vital decomposition?

We may reckon with Drs Bidder and Schmidt† that an animal body contains 35.45 grammes of nitrogen per kilogramme; and, therefore, time. Money, like genius, may comprehend success in a hundred things—but still, as a rule, one thing at a time; that thing must be completed or relinquished before you turn to another.

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* Devergie, 'Médicine Légale,' t. ii. chap. 5.

† 'Die Verdauungssäfte und der Stoffwechsel,' p. 400.

For a young man of a gentleman's station and a cadet's income, the only show needed is that which probably pleases himself the most —the effect produced by his own personal appearance. Dress will therefore not unreasonably, and by no means frivolously, demand some of his thoughts and much of his money. To the station of a young aspirant of fashion in the polite world, who is known not to be rich, it matters nothing what he pays for his lodging: he can always give his address at a club or hotel. No one cares how much or how little he pays for his dinner. No fine lady inquires if he calls at her house on foot or in a carriage. But society expects him to dress as much like a gentleman as if he were a young duke; and, fortunately, as young dukes nowadays do not wear gold lace and miniver, this is no unreasonable exaction on the part of society. A gentleman's taste in dress is, upon principle, the avoidance of all things extravagant. It consists in the quiet simplicity of exquisite neatness; but, as the neatness must be a neatness in fashion, employ the best tailor; pay him ready money, and on the whole you will find him the cheapest.

Still, if a young man of the gay world means to do the best that he can for his person, and really does obtain a certain rank or repute should it be only said of him that he is extremely well dressed, he will remember that no man in great capitals, without pre-eminent claims of fortune, birth, or beauty, ever really finds a place in *haut ton* without some cultivation of mind. All the men I have ever known, who have lifted themselves into authority in the inner circles of fashion, have been men of considerable intellectual accomplishment. They have either had wit or humour to a fine degree, or admirably strong sense and judgment, or keen penetration into character; they have been, from qualities far below the surface, either charming or instructive companions.

Mere dandies are but cut flowers in a bouquet—once faded, they can never reblossom. In the drawing-room, as everywhere else, Mind in the long-run prevails. And, O well-booted Achaian! for all those substantial good things which money well managed commands, and which, year after year, as you advance in life, you will covet and sigh for,—yon sloven, thick-shoed and with cravat awry—whose mind, as he hurries by the bow-window at White's, sows each fleeting moment with thoughts which grow not blossoms for bouquets but corn-sheaves for garners—will, before he is forty, be far more the fashion than you. He is commanding the time out of which you are fading. And time, O my friend, is money! time wasted can never conduce to money well managed.

that an animal of 130 lb., the mean weight of a man, contains 4.6 lb. of nitrogen.

Then again, taking our numbers from an equally sound and independent source, we may estimate with Baron Liebig * that the liquid and solid excreta of a man by kidneys and bowels for a year contains 16.41 lb. of nitrogen, or for three months and a half, 4.7 lb. of nitrogen.

That is to say, that in three months and a half a quantity of nitrogen is removed by excretion, or vital decay, equal to that contained in the whole bulk of the chief nitrogenous tissue.

What attraction has this term of three months and a half for us?—what memories does it rouse? Why, that was the very time we fixed upon for the fleshy framework of the corpse to melt away in. Here is a pregnant fact, a light thrown on the mysteries of nature from a most unpromising source! Dead flesh and living flesh last as nearly as possible the same time—the former, if anything, rather the longest. As far as we can judge, the albumen, fibrin, gelatin, &c., which make up the live body, differ in nowise from the same matters dead; they are liable to the same changes, affected by the same reagents, and naturally are resolved into their elements in the same time; just as the stone in a statue or a wall is to a mineralogist the same stone as it was in the quarry, liable to the same accidents, and possessed of the same properties, though temporarily endowed with a different value.

What, then, elevates to the dignity of living creatures, and gives loveliness to, the masses of organic matter which are growing, moving, breathing, thinking, all around us? It is the power of the individual life to create and retain its own special and individual form. A man has no right of property over the particles of his body, except so long as they remain particles of his body, and retain his form. He hardly calls *his* the snippings of his hair or the parings of his nails, much less the carbonic acid he exhales from his lungs or skin; all that he throws off is by common consent claimed as a perquisite by the public; and the battle-fields which he has fertilised with his kindred's blood enrich not him, but the fortunate proprietor. Yet as long as these organic constituents retain the *form* impressed upon them by the individual life, they are more truly his than any portion of his inheritance.

It is then the form, the individual and indivisible life, which constitutes the Self; and it is not the changing, decaying matter which "was mine, is his, and may be slave to thousands." The organic materials are the *property* of the form so long as it retains them; they are a floating capital. Over the innate essential nature of the material it has no control. Life cannot make the brute matter which it uses last longer than what it leaves unused, but it has the power of making them anew, and building them up into a certain shape for the period of their assigned duration. In short, LIFE IS RENEWAL.

To speak, therefore, of "a superabundance of life," or of an "excess of vital action," is a contradiction in terms. There *cannot* be too active a renewal of the tissues, for the fresher their organic constituents, the more serviceable they are, and the longer duration they have before them. There *cannot* be too close an adherence to that typical form which it is the business of renewal to keep up, any more than there can be too exact an obedience to law or order.

The *most active* renewal of the body possible, the highest possible development of life in every part, is HEALTH.

The *complete* cessation of renewal is DEATH.

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* 'Chemistry of Agriculture and Physiology,' part i. chap. ix.

The *partial* cessation, or arrest, is DISEASE.

In Death the flesh goes on being decomposed as during life; but, not being renewed, the form is lost entirely. In Disease, decomposition goes on, but life, or renewal, flags, and the decomposing wearing-out tissues are not properly pushed out by new-formed substance. They are retained as part of the imperfect body—a sort of "death in life"—and are rightly termed by the pathologist "degenerate." They are generated, but not *re*-generated; they are generated in an inferior mould of form.

Take as an example what happens sometimes to red flesh or muscle. We all know that if an animal's limbs are duly employed, the muscles keep up their shape and their vigorous power of contraction; their tissue is of a rich bright-red colour when the animal is fully grown, and is firm and elastic. Examine it under a microscope of pretty high power—say with a quarter-inch object-glass—and you will find it made up of even parallel fibres, each fibre seeming to be engraved ever with delicate equidistant cross-markings, like a measuring-tape very minutely divided. The more the muscle has been used in a well-nourished frame, the more closely it conforms to the typical specimen of the physiologist;

> "Use, use is life; and he most truly lives
> Who uses best."

But suppose this muscular fibre has been unemployed—suppose it is in the biceps of an Indian fakeer, who has fastened his arm upright till it has become immovable, or the glutœus of a one-legged soldier, or the calf of a Chinese belle, or in a paralysed limb—then the flesh is quite different in aspect; it is flabby and inelastic, of a pale yellowish hue, and makes greasy streaks on the knife that cuts it. Sometimes even all traces of fibres have disappeared, and it is converted into an unhealthy fat. Sometimes you may trace fibres under the microscope, but their outline is bulging and irregular, the cross-markings are wanting, and you see dark refracting globules of oily matter in them instead. In short, the muscle is degenerating into fat, retaining in a great measure its shape, but losing its substance. Such is, by God's law, the penal consequence of not using His gifts for four or five months.

Now, go back to our first sepulchral illustrations. M. Devergie found that, in a period of between four and five months, the flesh of a corpse is converted into a substance technically termed "adipocere;" that is, an oleaginous substance between fat and wax—an artificial fat of chemical decomposition. This is exactly the same as happened to the disused muscle in the case just quoted. At the Morgue, a stream of water washes away the fetid gases from the subject of M. Devergie's observations, and in the living body destructive absorption and excretion remove the more directly noxious particles; in both there remains the same oleaginous residuum.

The instance chosen of diseased structure was purposely an extreme one; but even there, a very advanced degree of partial death was seen not to be inconsistent with life. A minor degree is by no means inconsistent even with utility and a certain performance of duty. Look at a man whom his physician knows to have a weak or slightly-dilated heart; he goes on with his profession, mixes in society, enjoys his quiet pleasures, and may even insure his life by paying an extra premium. Yet, if an accident at any time should cut him off suddenly, the muscular tissue of the heart is found pale and soft, and under the microscope the fibres are deficient in clear outline and in cross-markings, and exhibit here and there minute specks of that fatty degeneration which was so conspicuous to the naked eye in M. Devergie's subjects, and in the completely paralysed limb. The more dilated and the more weak the heart, the more widespread is this degeneration. Yet enough active structure is left to carry on the work of the heart, and perhaps to prolong life to its allotted threescore years and ten.

A close imitation of the pathological process may be made by soaking a piece of muscle, say from a healthy sheep's heart, in a running stream, in weak spirits and water, or in nitric acid and water, for a few weeks, when sections made from time to time will exhibit the several stages of fatty degeneration, from the minute specks in the scarcely-altered muscle up to complete conversion into adipocere.

Remark now, that in these cases of fatty degeneration or decay, that which replaces the highly-organised animal matter is not utterly inorganic. It is less organised, and less organisable, but still capable of being called alive. Fat is part of our living bodies, and a necessary part; but still it is not capable of performing the highly vital duties of muscular tissue, of being *as thoroughly* alive. Degenerated products, therefore, as long as they form part of the body, may still be said to be alive, but *less* alive than the normal tissues they replace; and degenerate growth may be justly described as " diminished life ;" or, in the words of a former paragraph, " partial death." Degeneration, in short, is a *relapse* into a lower form of organic life, and exhibits itself, therefore, in a variety of grades and amounts. Occurring in various parts, it occasions a good half of the chronic illnesses which give work to the physician.

Let it be well understood that these half-living tissues are by no means necessarily diminished in size. A battered, tinkered vessel is often much bulkier than a strong new one ; and so these imperfectly nourished parts are often enlarged, and so have been wrongly supposed to be over-nourished. They often attain a most cumbrous weight and bigness without really containing enough available to do their work. They become, in truth, a foreign substance. Sometimes they acquire what seems almost like a parasitic life, and grow, as it were, independent of the body which they exist in. Then they are justly looked upon with a peculiarly unfavourable eye, and are called by the epithet " malignant." Cancer is the best-known example to quote ; and if the reader has ever watched its fatally-rapid increase, he is perhaps wondering that it should be put forward as an instance of diminished vitality. But let him watch further ; he will see that it never acquires the higher characteristics of life ; it never puts on the *form* of the part it is planted in, nor performs its duties. Moreover, its half-life, so easily acquired and so easily multiplied, is also easily lost. Its very tendency to die and to ulcerate is one of the chief dangers in which it puts the individual.

We must not, however, speak only of these dreadful afflictions of humanity, or our reader will think it is a subject with which he has no concern. We must come to more home matters. Doubtless it will be a shock to him to be told that, whenever he is the least ill, he has temporarily lost some of his life ; some portion of him is more dead than it ought to be. Pooh-pooh the idea as he will, he had better get used to it, for it is true ; and if he wishes to know anything of the nature of disease, it must be his leading principle. To familiarise his mind to it, we will take, as the next example, a nice common form of partial death, which he is sure to experience in a few weeks' time, and may then employ his leisure in thinking over these pages. Let our gentle reader " catch a cold " in his head, or his chest, or his throat, as he pleases. What is the consequence? If he looks at the back of the fauces in a mirror, he will see the surface red, puffy, and with the component parts, such as the uvula, enlarged. There is also poured out a quantity of slimy material, which his doctor calls "mucus," and which he coughs, or hawks, or blows off as the case may be. "Halloa!" he cries; "here surely is an active business going on; everything seems much more lively than usual; life is increased, not diminished." Not so fast. Let him examine in a microscope a little of this mucus, and he will find it to consist mainly of minute balls of jelly of a granular aspect, which are technically called "mucous and pus globules," floating quite free, and rolling over and over without any tendency to adhere together. Are these bodies something quite new, something which an inflamed membrane can produce, while a healthy one lacks the power? By no means; for they have been identified with those elementary forms of nascent life by which all organic matters grow; they are young *cells*. They are the form assumed by all liquid living material which, under the influence of life, is being transformed in a solid. They are a baby tissue strangled in its birth. Instead of uniting to clothe with a delicate skin, which anatomists call "epithelium," the surface of the membrane, they float off helpless from deficient vitality.

If our reader cannot manage to catch a cold, let him have a whitlow on his finger, or a boil, and study how the nail is stayed in its growth, and the skin killed; while the materials intended to renew them are arrested in their development, and go to be deposited as pus or matter, a concentrated form of unvitalised fluid very similar in every respect to mucus.

But he may ask, What is that redness and throbbing of the inflamed part? does not it show an increased circulation of the vital fluid, and therefore increased life? No more than the crowds in Fleet Street on Lord Mayor's Day show the activity of City business. On the contrary, the membrane is red because its blood-vessels are relaxed and dilated from loss of vital elasticity; the blood sticks in them as water in a bulged pipe; and the throng of blood, pushed on behind by the heart, throbs because of the obstruction.

"But the pain,—does not that show that the vital power of sensibility is increased? I cannot, in general, feel that I have got a finger or a throat; and now my whitlow and my cold remind me most disagreeably of the fact." No; pain does not indicate an increase of sensibility; in this case it is associated with a very marked decrease. In your catarrh the membrane of the fauces loses its delicate power of distinguishing flavours—everything tastes equally nasty. And your inflamed finger-tip is wanting in sensibility too: try it, and you will find, for any delicate work, such as feeling the fine lines of a copperplate, or the flaws in a polished surface, it fails in its duty. Pain, in fact, is a sure evidence of deficient vitality; a painful part is never performing its vital functions properly.

The same partial death, which has been hitherto described as constituting the various diseased states of the solid structures of the body, may attack also the fluids; and in them, as in the solids, may be exhibited either as a destructive relapse into a less organic life, or as an arrest of development. The poison of fever, for example, destroys and renders useless as nutriment some constituents of the blood; the insufficient blood is circulated to all parts of the body, causing, not local pain, but general *malaise* by its deficient vitality. The half-poisoned tissues allow the poisoned material to ooze through them, causing diarrhœas, exhalations of blood, purple blotches on the skin, and a general staining of the whole surface of a dusky hue. If the quantity of blood poisoned is moderate, it can be easily spared; it is carried off gradually by excretions, and its place is filled up in time by new blood. But if the rare case happens of so much being poisoned at once, that too little remains to carry on the business of the body, then death occurs by sudden shock; or if, through ignorance, carelessness, or false theory, there is an insufficient supply of material to take the place of the killed blood, the loss of vitality occurs more slowly. And occurring more slowly, it usually affects some part more than another; there is congestion and inflammation—that is, local death—of the digestive viscera, or of the lungs, or of the brain, and the patient's decease is assigned by name to that last cause. Thus, in fever, the blood relapses into a less organic form by reason of its vitality being destroyed by a morbid poison.

Let us next look for an instance of imperfect life in the blood through arrest of development. There is a condition, unfortunately very common, which medical men call Anæmia. The word means literally "bloodlessness," but in reality relates rather to deficient quality than deficient quantity. The circulating fluid cannot well help filling up the hollow vessels which contain it, but it is wanting in the most highly organised, the most truly living of its constituents. It is pale, from the diminished numbers of those floating red globules which give its natural hue. This capital of red globules is by far the most important portion of the blood; so much so, indeed, that it may be taken as a direct measure of corporeal and mental vigour; a man possesses a larger proportion than a woman, a strong man more than a weak man, an adult more than a youth or an ancient, a patient after recovery more than during his sickness of whatever kind, a horse in high condition more than when brought up from grass.

Considering, therefore, its importance, it is astonishing to find how much this capital may be encroached upon without a bankruptcy. For example, Dr Andral has analysed the blood of a patient with anæmia, where the blood-globules amounted to less than 39 parts in 1000, whereas their natural proportion should be at least 120 parts in 1000. More than two-thirds of this constituent was missing! And yet the patient was living and moving, and very likely quite recovered in the end if rational treatment was adopted. Now, in pure anæmia there is not found any degenerated devitalised substance; the missing globules have not relapsed into a lower life, so that their ruins or debris should constitute a foreign morbid matter; but they have, in fact, been used up in the regular way, to supply materials for the tissues, as they are moulted off from day to day. At the same time, there has been a want of renewal, an arrest of the continuous development of the blood, which is necessary to complete life.

Pure anæmia has been spoken of; but, as might have been expected, this defective supply of the materials of growth much weakens the vitality of many of the manufacturing and excreting viscera. The liver is not so lively as it should be, and some of the colour it ought to get rid of remains in the blood, chronically staining the skin of a bilious hue. Or perhaps the kidneys work only half-time, and the urea which they ought to drain off is retained, causing a very serious derangement of health. Thus there is a mixed pathology in these cases, a combination of arrested life, and of a relapse into a lower life; the life of the organ is diminished, and it leaves behind, in the system, substances of inferior vitality which it is its business to excrete or separate.

Or again, anæmia may so depress the creative power of the blood, that instead of the structure of the body being built up with elastic and vitalised fibrin, it has to put up with a cheesy brittle substance called tubercle. This is just the sort of fraud a rascally contractor commits, when he lays your floors on half-dried timbers. Your beams are destroyed by dry-rot, and the lungs in which tubercle has been substituted for healthy connective tissue, gradually soften and break up. The effectual remedy in both instances is to look after the builders, to preserve the honesty of the one and the vitality of the other.

It is obvious that, if various accidental circumstances direct to various parts of the body even these few elementary forms of disease which there is space to mention here, a great variety of abnormal phenomena might be produced. Though there is only one way of being right, there are thousands of ways of being wrong. These thousands of ways of being wrong have received much attention from minds with a taste for order; they have been classified into groups; and, if, unfortunately, the orderly mind was afflicted with a theory, sadly have facts suffered sometimes by the Procrustean bed into which they have been forced. On the whole, perhaps, these Νοσολογοι (people who talk about diseases) have been a convenience, for their nomenclature often enables us to describe in one word what otherwise would require a parenthesis. But their labours have had this bad result; they have assigned a positive existence to that which, in reality, is a negation. "*A Disease*" under their manipulation, instead of being a mode in which life is deficient, becomes an actual motive power; the giving it a generic and specific name associates it in our minds with the subjects of a naturalist's studies, and we get to attribute to it individual characteristics, and to allot to it individual actions. The consequences have been very much those which would follow, in optics, the regarding a shadow as a material object instead of as an absence of light; or, in general physics, the accounting cold an active agent. The disease came to be considered as an enemy to be fought against; all the phenomena classified among its appurtenances were viewed as actions to be opposed and checked; and, in short, all the attention was directed to the removal of death, instead of to the replacement of life. Each mode of erring from health was reared up into an entity instead of an abstraction—a separate foe, requiring special weapons for his discomfiture.

Less harm than might have been feared has been done by these false notions. In the first place, patients are tougher than usually supposed, and will stand a deal of wrong treatment; and, secondly, experience has somewhat checked the bold hand of a relentless logic. Still, it can hardly be doubted that the increased chance of recovery under professional treatment has not been what might have been expected from the advance of science. But of late medical art appears to have turned over a new leaf; nosologists are at a discount, and under the influence of that modern rational pathology, of which a popular sketch is attempted in these pages, attention seems directed to the maintenance of life in the body more than to the expulsion of death out of it. Such seems to be the intention of all the modes of treatment which, without falling in with the dogmas of any particular "*pathy*," have yet been silently adopted by the rational adherents of each within the last few years. We may instance the care bestowed upon the selection of alimentary substances, the use of water, of oxygen, of iron, of animal oils, of chlorine, of soda in doses more like a food than a drug, of lactic and other organic acids, of salts of phosphorus and lime, of sulphur, ammonia, bile, pepsin, and several other agents established by common consent without being suggested by any previous theory of therapeutics, or traditional rules of the medical art. These are constituents of the animal frame, and are administered and trusted to as supplying obvious abnormal deficiencies of matter.

A living body may be compared to a stately and extensive mansion, constructed of beautiful but very perishable materials, all of which need continual repair to keep up the form and usefulness of the structure. All the materials are perishable, but in different degrees, and with different rapidity. The permanent Architect is the indwelling Life, and he best performs his duty, not by fits and starts of work, but by continuous vigilant industry. He should be every moment removing decaying materials from the walls and working machinery, to be carted away at convenient periods, and every moment supplying their place by fresh. Thus there are two departments carried on simultaneously—the Destructive and Constructive business; and upon their harmony and completeness depends the perfection of life which we call health. Both are necessary; but the deficiency of both or of either, or the preponderance of one over the other in various parts, or their deficiency in one part while others remain active, constitutes a deficiency of life—a disease.

With the destructive department we are best acquainted. We have possessed from time immemorial a long list of drugs, which are classified according to the organ through whose portals they promote destructive metamorphosis. Sudorifics, emetics, purgatives, diuretics, expectorants, &c., are familiar to doctors and amateurs; while others, as mercury for example, are known as general liquifacients, which promote destructive metamorphosis generally, and a consequent increase of solid evacuation from all quarters. We are in possession also of some agents which arrest this metamorphosis, such as alcohol, opiates, astringents—some acting on one part and some on another: and when construction does not keep pace with destruction—when the latter is not, indeed, too fast absolutely, but too fast comparatively—we apply them empirically with advantage, so as to keep the two in harmony. By this interference, rationally interposed, we may assist the architect much in one half of his duty, and thus, perhaps, contribute in an indirect way towards making him more active in the other half. At all events, by the judicious use of destructives and arresters of metamorphosis, we may, in the first case, make room for, and in the second case allow time for, normal renewal of the tissues.

But the *Constructive* pharmacopœia is sadly defective. Since the swindling alchemists brought discredit on the search, ridicule has always been attached to the hope of there being in nature reagents capable of directly and generally augmenting the vital power of growth, of acting on the constructive renewal of the body—as mercury, for instance, does on the destructive. Yet there is, *a priori*, no absurdity in the idea. How, except by experiment, could it have been known that a small pinch of such a thing as calomel possessed the power of doubling vital decay? And how, therefore, can any one foreknow that the other part of vitality is incapable of being immediately acted upon? All we can say is, that such an agent has certainly not yet been found: for if such were the case, no power short of Omnipotence could suppress the knowledge: a few months would spread the news over the whole civilised world, and bring into universal use the Elixir of Life.

"The Elixir of Life"—the very words make the reader smile condescendingly, as when he reads the fairy literature of his nursery. He associates it directly with magic, unlawful arts, and some secret wrung from spiritual natures, by which their immortality might be suddenly acquired for flesh and blood. This idea is purely derived from romances, and was never entertained or thought of by the Rosicrucians, who were as firm believers as we can be in the divine scheme which makes death a necessary step to eternal life.* What they really sought for was a substance which would directly restore the deficient vitality of bodies rendered unequal to their duties by an abnormal state. They saw clearly enough that such a substance, or such a set of substances, would be an all-powerful direct healer of all disease—a Panacea not by destroying a poison, but by conferring vitality—in short, an Elixir of Life. They saw that, to the healthy flesh, various material substances in the shape of meat and drink actually supplied life; when they were taken away, the life diminished; when they were replaced, it increased. Why should they not ransack the material world which God has given us to be ransacked, to know if there did not exist something which would in the same way restore life to these same parts when they failed through weakness? They had no notion of abolishing death as the final end of all living beings, but simply of abolishing *unnecessary* death, and of enabling the machinery of the body to attain the term which it is originally constructed to last. Vitality, as we see, is in very various quantities in the body at various times—now abundant, now deficient. Material substances increase and diminish it—was it, then, madness to believe in the possibility of finding the best mode of directly increasing it? Truly, the medieval men of science wasted their time, and saved ours, in their search for a substance which could do this—we know now all pure substances, and we know there is none capable of it. But may not the same object be attained by the discovery of a great principle of guidance in treating the diseased body?—great, and therefore simple; and because simple, therefore as yet utterly unthought of. Surely the direction of science towards such an object is not ridiculous.

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* The Christianity of alchemists is stoutly defended by Robert Fludd (Robertus

In the mean time, let us not be idle; let us make the nearest approach possible to the desired goal by the use of indirect means. The fact of having the goal before us will make those means more efficacious. For example, we can, by the study of pathology, find out what special material is wanting in each morbid state, and we can provide an ample supply of that, so that the vital power may not have cause to complain that it cannot build for lack of bricks. Where the special material is beyond our crude manufacturing power, we may supply something as near it in nature as we can. Then we may bring the passages by which these materials enter the body—the absorbents and lacteals—into their highest state of activity. We may take care, for instance, that the thoroughfare to them is not impeded by a layer of mucus on the membrane. And we may also by a class of medicines, which act specially on the mucous membranes, and are popularly called "tonics," recall them to a true sense of their duties. We may even in some cases sanction the employment of "destructives" to clear the tissues of effete worn-out materials, which are stopping the way of construction. By these indirect means empiricism has already led us to effect much, and doubtless rational science will teach us to effect more, now that it is in the right road. And thus, without finding the Elixir of Life, we may, laboriously and indirectly, but rationally, still answer to some extent the prayer of the sick psalmist, "Renew my age."

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de Fluctibus) in his 'Tractatus apologeticus integritatem Societatis de Rosea Cruce defendens. Lugd. Batav., 1617.'